Comparison Values for Acute Inhalation Exposure at Bridgeton Landfill

All results in parts per billion (ppb)

Comparison values for acute inhalation exposures are developed to be protective for varying exposure times and are also developed based on varying levels of effect; therefore, the comparison values listed below are values available from multiple sources and represent the noted varying exposure times and levels of effect. In evaluating acute inhalation data, DHSS initially compares to the most conservative available value. If the most conservative comparison level is exceeded, DHSS may also compare to other comparison values that more accurately represent the exposure period being assessed. Additionally, in the absence of available comparison values for acute exposure, DHSS may compare to levels protective for chronic exposure.

	Compound	[1] ATSDR Acute MRL (1-14 days)	[2] CalEPA Acute REL (1-hr unless noted otherwise)	[3] NAC AEGL-1 (10-min)	[3] NAC AEGL-1 (8-hr)	[4] AIHA ERPG-1 (1-hr)	[5] NIOSH REL (10-hr)	[6] OSHA PEL (8-hr)	[7] NAAQS
Aldehydes	Acetaldehyde	na	260 (1-hr); **160 (8-hr)**	45,000	45,000	10,000	na	200,000	na
	Acetone	**26,000**	na	200,000	200,000	na	250,000	1,000,000	na
	Acrolein	3	1.1 (1-hr); **0.3 (8-hr)**	30	30	50	100	100	na
	Benzaldehyde	na	na	na	na	na	na	na	na
	Crotonaldehyde (total)	na	na	**190**	**190**	200	2,000	2,000	na
	Formaldehyde	40	44 (1-hr); **7 (8-hr)**	900	900	1,000	16	750	na
	Hexaldehyde	na	na	na	na	na	na	na	na
	MEK & Butyraldehyde	na	**4,500**	200,000	200,000	na	200,000	200,000	na
	Methacrolein	na	na	**200**	**200**	na	na	na	na
	m-Tolualdehyde	na	na	na	na	na	na	na	na
	Propionaldehyde	na	na	**45,000**	**45,000**	na	na	na	na
	Valeraldehyde	na	na	na	na	na	**50,000**	na	na
Amines	Butylamine and isomers	na	na	na	na	na	na	na	na
	Cyclohexylamine	na	na	1,800	1,800	na	10,000	na	na
	Diethanolamine	na	na	na	na	na	**3,000**	na	na
	Diethylamine	na	na	na	na	na	**10,000**	25,000	na
	Diethylenetriamine	na	na	na	na	na	**1,000**	na	na
	Dimethylamine	na	na	10,000	10,000	**600**	10,000	10,000	na
	Ethanolamine	na	na	na	na	na	**3,000**	**3,000**	na
	Ethylamine	na	na	**7,500**	**7,500**	na	10,000	10,000	na
	Ethylenediamine	na	na	AEGL-1: na; AEGL-2: 12,000	AEGL-1: na; **AEGL-2: 4,800**	na	10,000	10,000	na
	Ethylhexylamine	na	na	na	na	na	na	na	na
	Isobutylamine	na	na	na	na	na	na	na	na
	Isopropylamine / Propylamine	na	na	na	na	na	na	**5,000**	na
	Methylamine	na	na	15,000	15,000	**10,000**	**10,000**	**10,000**	na
	Triethylamine	na	**680**	na	na	na	na	25,000	na
	Trimethylamine	na	na	8,000	8,000	**100**	10,000	na	na

	Compound	[1]ATSDR Acute MRL (1-14 days)	[2]CalEPA Acute REL (1-hr unless noted otherwise)	[3]NAC AEGL-1 (10-min)	[3]NAC AEGL-1 (8-hr)	[4]AIHA ERPG-1 (1-hr)	[5]NIOSH REL (10-hr)	[6]OSHA PEL (8-hr)	[7]NAAQS
Ammonia	Ammonia	1,700	4,500	30,000	30,000	25,000	25,000	50,000	na
Carbon Monoxide	Carbon Monoxide	na	20,000	AEGL-1: na; AEGL-2: 420,000	AEGL-1: na; AEGL-2: 27,000	200,000	35,000	50,000	9,000 (8-hr primary); 35,000 (1-hr primary)
Carboxylic Acids	2-Ethylhexanoic Acid	na	na	na	na	na	na	na	na
	2-Methylbutanoic Acid	na	na	na	na	na	na	na	na
	2-Methylpentanoic Acid	na	na	na	na	na	na	na	na
	2-Methylpropanoic Acid (Isobutyric)	na	na	na	na	na	na	na	na
	3-Methylbutanoic Acid (Isovaleric)	na	na	na	na	na	na	na	na
	3-Methylpentanoic Acid	na	na	na	na	na	na	na	na
	4-Methylpentanoic Acid (Isocaproic)	na	na	na	na	na	na	na	na
	Acetic Acid	na	na	na	na	5,000	10,000	10,000	na
	Benzoic Acid	na	na	na	na	na	na	na	na
	Butanoic Acid (Butyric)	na	na	na	na	na	na	na	na
	Cyclohexanecarboxylic Acid	na	na	na	na	na	na	na	na
	Heptanoic Acid (Enanthoic)	na	na	na	na	na	na	na	na
	Hexanoic Acid (Caproic)	na	na	na	na	na	na	na	na
	Nonanoic Acid (Pelargonic)	na	na	na	na	na	na	na	na
	Octanoic Acid (Caprylic)	na	na	na	na	na	na	na	na
	Pentanoic Acid (Valeric)	na	na	na	na	na	na	na	na
	Propionic Acid (Propanoic)	na	na	na	na	na	10,000	na	na
[8]Dioxins/Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	na	na	na	na	na	na	na	na
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	na	na	na	na	na	na	na	na
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	na	na	na	na	na	na	na	na
	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	na	na	na	na	na	na	na	na
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	na	na	na	na	na	na	na	na
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	na	na	na	na	na	na	na	na
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	na	na	na	na	na	na	na	na
	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	na	na	na	na	na	na	na	na
	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	na	na	na	na	na	na	na	na
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	na	na	na	na	na	na	na	na
	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	na	na	na	na	na	na	na	na

	Compound	[1]ATSDR Acute MRL (1-14 days)	[2]CalEPA Acute REL (1-hr unless noted otherwise)	[3]NAC AEGL-1 (10-min)	[3]NAC AEGL-1 (8-hr)	[4]AIHA ERPG-1 (1-hr)	[5]NIOSH REL (10-hr)	[6]OSHA PEL (8-hr)	[7]NAAQS
Hydrogen Chloride	Hydrogen Chloride	na	**1,400**	1,800	1,800	3,000	na	na	na
Hydrogen Cyanide	Hydrogen Cyanide	na	**300**	2,500	1,000	ERPG-1: na; ERPG-2: 10,000	na	10,000	na
Mercury	Mercury (elemental)	na	0.07 (1-hr); **0.007 (8-hr)**	AEGL-1: na; AEGL-2: 380	AEGL-1: na; AEGL-2: 40	ERPG-1: na; ERPG-2: 250	6	12	na
PAHs	1-Methylnaphthalene	na	na	na	na	na	na	na	na
	2-Methylnaphthalene	na	na	na	na	na	na	na	na
	Acenaphthene	na	na	na	na	na	na	na	na
	Acenaphthylene	na	na	na	na	na	na	na	na
	Anthracene	na	na	na	na	na	na	na	na
	Benzo(a)anthracene	na	na	na	na	na	na	na	na
	Benzo(a)pyrene	na	na	na	na	na	na	na	na
	Benzo(b)fluoranthene	na	na	na	na	na	na	na	na
	Benzo(e)pyrene	na	na	na	na	na	na	na	na
	Benzo(g,h,i)perylene	na	na	na	na	na	na	na	na
	Benzo(k)fluoranthene	na	na	na	na	na	na	na	na
	Chrysene	na	na	na	na	na	na	na	na
	Dibenz(a,h)anthracene	na	na	na	na	na	na	na	na
	Fluoranthene	na	na	na	na	na	na	na	na
	Fluorene	na	na	na	na	na	na	na	na
	Indeno(1,2,3-cd)pyrene	na	na	na	na	na	na	na	na
	Napthalene	na	na	na	na	na	**10,000**	**10,000**	na
	Phenanthrene	na	na	na	na	na	na	na	na
	Pyrene	na	na	na	na	na	na	na	na
Reduced Sulfur Compounds	2-Methylthiophene	na	na	na	na	na	na	na	na
	3-Methylthiophene	na	na	na	na	na	na	na	na
	Bromothiophene	na	na	na	na	na	na	na	na
	Carbon Disulfide	na	2,000 (6-hr)	17,000	6,700	**1,000**	**1,000**	20,000	na
	Carbonyl Sulfide	na	na	AEGL-1: na; AEGL-2: 69,000	AEGL-1: na; **AEGL-2: 23,000**	na	na	na	na
	Diethyl Disulfide	na	na	na	na	na	na	na	na
	Diethyl Sulfide	na	na	na	na	na	na	na	na
	Dimethyl Disulfide	na	na	na	na	**10**	na	na	na
	Dimethyl Sulfide	na	na	na	na	**500**	na	na	na
	Ethyl Mercaptan	na	na	**1,000**	**1,000**	na	na	na	na
	Hydrogen Sulfide	70	**30**	750	330	100	na	na	na

	Compound	[1]ATSDR Acute MRL (1-14 days)	[2]CalEPA Acute REL (1-hr unless noted otherwise)	[3]NAC AEGL-1 (10-min)	[3]NAC AEGL-1 (8-hr)	[4]AIHA ERPG-1 (1-hr)	[5]NIOSH REL (10-hr)	[6]OSHA PEL (8-hr)	[7]NAAQS
Reduced Sulfur Compounds	Isobutyl Mercaptan	na	na	na	na	na	na	na	na
	Isopropyl Mercaptan	na	na	na	na	na	na	na	na
	Methyl Mercaptan	na	na	AEGL-1: na; AEGL-2: 59,000	AEGL-1: na; AEGL-2: 19,000	**5**	na	na	na
	Methylethylsulfide	na	na	na	na	na	na	na	na
	n-Butyl Mercaptan	na	na	na	na	na	na	**10,000**	na
	n-Propyl Mercaptan	na	na	na	na	na	na	na	na
	sec-Butyl Mercaptan	na	na	na	na	na	na	na	na
	Sulfur Dioxide	**10**	250	200	200	300	2,000	5,000	75 (1-hr primary); 500 (3-hr secondary)
	tert-Butyl Mercaptan	na	na	na	na	na	na	na	na
	Tetrahydrothiophene	na	na	na	na	na	na	na	na
	Thiophene	na	na	na	na	na	na	na	na
	Thiophenol	na	na	AEGL-1: na; AEGL-2: 1,000	AEGL-1: na; **AEGL-2: 170**	na	na	na	na
	Total Unidentified Sulfur	na	na	na	na	na	na	na	na
VOCs	1,1,1-Trichloroethane	**2,000**	12,500	230,000	230,000	350,000	na	350,000	na
	1,1,2,2-Tetrachloroethane	na	na	na	na	na	**1,000**	5,000	na
	1,1,2-Trichloroethane	na	na	na	na	na	**10,000**	**10,000**	na
	1,1-Dichloroethane	na	na	na	na	na	**100,000**	**100,000**	na
	1,1-Dichloroethene	na	na	na	na	ERPG-1: na; **ERPG-2: 500,000**	na	na	na
	1,2,4-Trichlorobenzene	na	na	na	na	na	na	na	na
	1,2,4-Trimethylbenzene	na	na	180,000	45,000	na	**25,000**	na	na
	1,2-Dibromomethane	na	na	52,000	4,600	na	**45**	20,000	na
	1,2-Dichlorobenzene	na	na	na	na	na	na	na	na
	1,2-Dichloroethane	na	na	na	na	50,000	**1,000**	50,000	na
	1,2-Dichloropropane	**50**	na	na	na	na	na	75,000	na
	1,3,5-Trimethylbenzene	na	na	180,000	45,000	na	**25,000**	na	na
	1,3-Butadiene	na	na	670,000	670,000	10,000	na	**1,000**	na
	1,3-Dichlorobenzene	na	na	na	na	na	na	na	na
	1,4-Dichlorobenzene	**2,000**	na	na	na	na	na	75,000	na
	1,4-Dioxane	2,000	**800**	17,000	17,000	na	na	100,000	na
	2,2,4-Trimethylpentane	na	na	na	na	na	na	na	na
	2-Butanone (Methyl-Ethyl-Ketone)	na	**4,500**	200,000	200,000	na	200,000	200,000	na
	2-Hexanone	na	na	na	na	na	**1,000**	100,000	na
	2-Propanol (IPA)	na	**1,300**	na	na	na	400,000	400,000	na
	4-Ethyltoluene	na	na	na	na	na	na	na	na
	4-Methyl-2-Pentanone (MiBK)	na	na	na	na	na	**50,000**	100,000	na

	Compound	[1]ATSDR Acute MRL (1-14 days)	[2]CalEPA Acute REL (1-hr unless noted otherwise)	[3]NAC AEGL-1 (10-min)	[3]NAC AEGL-1 (8-hr)	[4]AIHA ERPG-1 (1-hr)	[5]NIOSH REL (10-hr)	[6]OSHA PEL (8-hr)	[7]NAAQS
VOCs	Acetone	**26,000**	na	200,000	200,000	na	250,000	1,000,000	na
	Acrylonitrile	**100**	na	4,600	4,600	10,000	1,000	2,000	na
	Allyl Chloride	na	na	2,800	2,800	3,000	**1,000**	**1,000**	na
	Benzene	**9**	400 (6-hr)	130,000	9,000	50,000	100	1,000	na
	Benzyl Chloride	na	**46**	na	na	1,000	na	1,000	na
	Bromodichloromethane	na	na	na	na	na	na	na	na
	Bromoform	na	na	na	na	na	**500**	**500**	na
	Bromomethane	**50**	1,000	AEGL-1: na; AEGL-2: 940,000	AEGL-1: na; AEGL-2: 67,000	ERPG-1: na; ERPG-2: 500,000	na	na	na
	Carbon Disulfide	na	2,000 (6-hr)	17,000	6,700	**1,000**	**1,000**	20,000	na
	Carbon Tetrachloride	na	**300 (7-hr)**	58,000	19,000	20,000	na	10,000	na
	Chlorobenzene	na	na	**10,000**	**10,000**	na	na	75,000	na
	Chlorodifluoromethane	na	na	na	na	na	1,000,000	na	na
	Chloroethane	**15,000**	na	na	na	na	na	1,000,000	na
	Chloroform	100	**30 (7-hr)**	AEGL-1: na; AEGL-2: 120,000	AEGL-1: na; AEGL-2: 29,000	ERPG-1: na; ERPG-2: 500,000	na	na	na
	Chloromethane	**500**	na	AEGL-1: na; AEGL-2: 1,100,000	AEGL-1: na; AEGL-2: 380,000	ERPG-1: na; ERPG-2: 400,000	na	100,000	na
	cis-1,2-Dichloroethene	na	na	**140,000**	**140,000**	na	na	na	na
	cis-1,3-Dichloropropene	na	na	na	na	na	na	na	na
	Cyclohexane	na	na	na	na	na	**300,000**	**300,000**	na
	Dibromochloromethane	na	na	na	na	na	na	na	na
	Dichlorodifluoromethane (R12)	na	na	na	na	na	**1,000,000**	**1,000,000**	na
	Dichlorofluoromethane	na	na	na	na	na	**10,000**	1,000,000	na
	Dichlorotetrafluoroethane	na	na	na	na	na	**1,000,000**	**1,000,000**	na
	Ethanol	na	na	na	na	1,800,000	**1,000,000**	**1,000,000**	na
	Ethyl Acetate	na	na	na	na	na	**400,000**	**400,000**	na
	Ethylbenzene	**5,000**	na	33,000	33,000	na	100,000	100,000	na
	Heptane	na	na	na	na	na	**85,000**	500,000	na
	Hexachlorobutadiene	na	na	na	na	1,000	**20**	na	na
	Hexane	na	na	AEGL-1: na; AEGL-2: 4,000,000 (higher than 10% of the LEL)	AEGL-1: na; AEGL-2: 2,900,000 (higher than 10% of the LEL)	na	**50,000**	500,000	na
	Methanol	na	**21,000**	670,000	270,000	200,000	200,000	200,000	na
	Methyl tert-Butyl Ether	**2,000**	na	50,000	50,000	5,000	na	na	na

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VOCs	Methylene Chloride	**600**	4,000	290,000	AEGL-1: na; AEGL-2: 60,000	300,000	na	25,000	na
	Propene	na	na	na	na	na	na	na	na
	Styrene	**5,000**	5,100	20,000	20,000	50,000	50,000	100,000	na
	Tetrachloroethylene (PCE)	**200**	2,900	35,000	35,000	100,000	na	100,000	na
	Tetrahydrofuran	na	na	na	na	**100,000**	200,000	200,000	na
	Toluene	**1,000**	9,800	200,000	200,000	50,000	100,000	200,000	na
	trans-1,2-Dichloroethylene	**200**	na	280,000	280,000	na	na	na	na
	trans-1,3-Dichloropropene	na	na	na	na	na	na	na	na
	Trichloroethylene (TCE)	na	na	260,000	**77,000**	100,000	na	100,000	na
	Trichlorofluoromethane	na	na	na	na	na	na	**1,000,000**	na
	Trichlorotrifluoroethane	na	na	na	na	na	**1,000,000**	**1,000,000**	na
	Vinyl Acetate	na	na	6,700	6,700	**5,000**	na	na	na
	Vinyl Bromide	na	na	na	na	na	na	na	na
	Vinyl Chloride	**500**	72,000	450,000	70,000	500,000	na	1,000	na
	Xylenes (technical mixture of o-xylene (95-47-6), m-xylene (108-38-3) and p-xylene (106-42-3))	**2,000**	5,000	130,000	130,000	na	100,000	100,000	na
	Total VOCs (tVOC)[9]	**5,000**	na	na	na	na	na	na	na

BOLD values indicate the most conservative value for that compound.

na = not available/not applicable

[1]Agency for Toxic Substances and Disease Registry (ATSDR) Acute Minimal Risk Levels (MRLs), March 2013. An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects. Acute MRLs are for exposures lasting from 1-14 days.

[2]California Environmental Protection Agency (CalEPA) Acute Reference Exposure Levels (RELs), February 2012. An acute REL is an exposure that is not likely to cause adverse effects in a human population, including sensitive subgroups, exposed to that concentration for the specified time period on an intermittent basis.

[3]National Advisory Committee (NAC) for Acute Exposure Guideline Levels (AEGLs), April 2013. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. AEGL-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure. AEGL-2 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

[4]American Industrial Hygiene Association (AIHA) Emergency Response Planning Guidelines (ERPGs), 2011. The ERPG-1 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor. The ERPG-2 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

[5]National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs), 2010. RELs are occupational exposure limits that represent a time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek.

[6]Occupational Safety and Health Administration Permissible Exposure Limits (PELs), 2010. PELs are occupational exposure limits that represent time-weighted average concentrations that must not be exceeded during any 8-hour workshift of a 40-hour workweek.

[7]National Ambient Air Quality Standards (NAAQS). Primary standards provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

[8]Because comparison values are not available for evaluating acute exposure to dioxins and furans, sample concentrations were converted to toxic equivalent (TEQ) values and compared to a screening level established for chronic exposure to 2,3,7,8-TCDD.

[9]Total VOC concentrations are compared to ATSDR's guidelines for public health actions in response to landfill fires (ATSDR Landfill Gas Primer, 2001). According to these guidelines, sustained total VOC concentrations exceeding 1-5 ppm above background levels may be cause for concern in residential areas. These exceedances indicate a need for compound-specific sampling for verification of the data and evaluation of public health concerns.